

Applicant: Liepold, Gerhard.
Application No.: Unassigned
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B. Amendments to the Claims:

Please cancel the existing claims and add the following new claims:

50. A valve (1, 121, 700, 800, 400, 900, 990) comprising a body having first and second open ends (2, 3) and a passageway (4) for fluid between the ends, the first end (2) including a first coupling means (54, 544, 540) for sealingly connecting the body about an opening (205) of a first external device (201) and a seal blocking an open area of the first end (2) which in use is placeable in register with the opening (205) of the external device (201), the valve (1, 121, 700, 800, 400, 900, 990) further including a seal displacement means movable within the body so as to interrupt the seal permitting fluid to pass along the passageway (4) between the ends (2, 3), the coupling means (54) and the seal presenting a sterilisable mating surface for sealingly mating with a mating surface (216) about the opening (205) in the first external device, wherein the seal is formed between a first plastics portion movable by the seal displacement means and a second plastics portion disposed about the open area of the first end of the valve, wherein one of the plastic portions has a protruding sharp rim (15) and the other plastics portion of the seal has a curved surface area (22) so that when the valve (1, 121, 700, 800, 400, 900, 990) is in the closed position, the sharp rim (15) engages the curved surface area (22) and displaces a portion of the curved surface area (22) thereby elastically deforming the materials of the sharp rim (15) and the curved surface area (22) to seal the opening of the valve (1, 121, 700, 800, 400, 900, 990).

51. A valve (1, 121, 700, 800, 400, 900, 990) as claimed in claim 50, wherein the engagement of the sharp rim (15) with the curved surface area (22) occurs during a linear motion of the sharp rim (15) relative to the curved surface area (22).

52. A valve (1, 121, 700, 800, 400, 900, 990) as claimed in claim 50, wherein the first plastic portion is integrally formed with the seal displacement means.

53. A valve (1, 121, 700, 800, 400, 900, 990) as claimed in claim 50, wherein the first plastic portion is provided by a plastic plug (18) integrally formed with the seal displacement means.

54. A valve (1, 121, 700, 800, 400, 900, 990) as claimed in claim 50, wherein the second plastic portion is integrally formed with the body of the valve.

55. A valve (1, 121, 700, 800, 400, 900, 990) as claimed in claim 50, wherein the second plastic portion comprises a wall defining a bore portion (13) having a cross-section converging towards the first end (2) of the valve (1, 121, 700, 800, 400, 900, 990) which in turn leads to a wall defining a bore portion (14) having a substantially uniform cross-section which is located adjacent the first end (2) of the valve, the boundary between the wall defining the converging bore portion (13) and the wall defining the uniform bore portion (14) defining the sharp rim (15), the first plastic portion having a body portion (19) with a cross-section converging towards the first end (2) of the valve and leading to an end portion (20) with a uniform cross-section, the end

portion (20) being adjacent the first end (20) of the valve in use and a transitional surface between the external surface of the body portion (19) and the external surface of the end portion (20) of the first plastic portion defining the curved surface area (22) so that when the opening of the valve is sealed the sharp rim (15) engages the curved surface area (22) and displaces a portion of the curved surface area (22) thereby elastically deforming the materials of the sharp rim (15) and the curved surface area (22).

56. A valve (1, 121, 700, 800, 400, 900, 990) as claimed in claim 50, wherein the curved surface area (22) has a predetermined radius.

57. A valve (1, 121, 400, 900, 990) as claimed in claim 50, in which the second end (3) of the body comprises a second coupling means (54, 544, 540) with a mating surface for sealingly connecting the body about an opening of a second external device.

58. A valve (1, 121, 400, 900, 990) as claimed in claim 57, in which the distance between the mating surfaces of the first and the second coupling means (54, 544, 540) remains unchanged during movement of the seal displacement means within the body between open and closed positions of the valve (1, 121, 400, 900, 990) so that in use the valve can connect mating surfaces about openings (205) of a first and a second external devices (201) separated by a distance equal to the distance between the mating surfaces of the body.

59. A valve (700, 800) as claimed in claim 50, in which the seal displacement means travels at least partially outside of the second end (3) of the body on actuation of the valve (700, 800).

60. A valve (700, 800) as claimed in claim 59, in which the displacement means comprise first and second ends (17, 53, 313, 312), the first end (17, 313) comprising the first plastic portion and the second end (53, 312) comprising a coupling means (554, 55, 557, 558) for sealingly connecting the displacement means about an opening (205) of a second external device (201).

61. A valve (1, 121, 700, 800, 400, 900, 990) as claimed in claim 50, including means (920, 850) for displaying to a user the actuation state of the valve.

62. A valve (1, 121, 700, 800, 400, 900, 990) as claimed in claim 50, in which the body comprises a hollow housing (5, 50, 301, 302, 410, 905, 906) extending between the first and the second open ends.

63. A valve (1, 121, 700, 800, 400, 900, 990) as claimed in claim 62, in which the seal displacement means comprises a piston (9, 19, 219, 309, 319, 329, 420) slidably movable within the housing, the piston having the first plastic portion formed at one end thereof.

64. A valve (1, 121, 700, 800, 400, 900, 990) as claimed in claim 50 comprising an operating means having an actuator (7, 117, 430) externally mounted on the body and movable between a first and a second end position, the actuator (7, 117, 430) being linked with the seal displacement means so that movement of the actuator (7, 117, 430) between the first and the second end positions causes the seal displacement means to translate along the passageway between open and closed positions.

65. A valve (1, 121, 700, 800, 400, 900, 990) as claimed in claim 64, in which the actuator (7, 117, 430) is linked with the seal displacement means via a cam pair.

66. A valve (1, 121, 700, 800, 400, 900, 990) as claimed in claim 50, in which at least one guide element (211, 311, 419) is provided in the valve to prevent rotational motion of the seal displacement means and to permit the seal displacement means to move only linearly in the passageway.

67. A valve as claimed in claim 50, in which a seal is provided at both the first and the second open ends of the body, each seal having a seal displacement means movably disposed within the passageway of the body so that the first and/or second ends may be sealed or opened.

68. A valve comprising a body having first and second open ends and a passageway for fluid between the ends, the first end including a coupling means for sealingly connecting the body

about an opening of an external device and a seal blocking the open area of the first end which in use is placeable in register with the opening of the external device, the valve further including a cam and follower arrangement for moving a seal displacement means movable within the body comprising an actuator, positioned concentrically about said body and rotatable about the axis of said body and having a pair of shaped slots and a piston having a pair of opposing outwardly projecting pins wherein each of said outwardly projecting pins are cooperatively engaged within said shaped slots and wherein each of said shaped slots has a first section that is substantially parallel to the longitudinal axis of said piston and a second section that is curved in a direction substantially perpendicular to the longitudinal axis of said piston, the piston is provided with a first plastics sealing plug movable by the seal displacement means into sealing engagement with a second plastics portion disposed about the open area of the first end.

69. A valve as claimed in claim 68, wherein said first section contacts said pins from 0 to 56 degrees rotation of said actuator and said second section contacts said pins from 56 to 80 degrees rotation of said actuator.

70. A valve as claimed in claim 68 in which said actuator includes a safety lock means for preventing undesired movement of the seal displacement means.

71. A valve as claimed in claim 68 including visible or tactile indication means for indicating to a user the position of the valve between its ready and deployed states.

72. A valve as claimed in claim 68, wherein said seal displacement means includes a first and a second internal seal arranged concentrically between said body and said seal displacement means, and longitudinally between said first and second open ends, wherein said first and second seal are separated by a distance parallel to the longitudinal axis of said displacement means.

73. A valve as claimed in claim 72, in which said distance separating said first and second seal is greater than the distance the seal displacement means moves from the ready state to the deployed state.

74. A valve as claimed in claim 68, in which the piston moves non-rotationally relative to the housing to open or close the valve.

75. A valve (1, 121, 400, 900, 990) comprising a body having first and second open ends (2, 3) and a passageway (4) for fluid between the ends, the first end (2) including a first coupling means (54, 544, 540) with a first mating surface and the second end including a second coupling means (54, 544, 540) with a second mating surface, the first and the second coupling means (54, 544, 540) being sealingly mateable with mating surfaces about openings (205) of first and second external devices (201) respectively and a seal blocking an open area of the first end (2) which in use is placeable in register with the opening (205) of the first external device (201), the valve further including a seal displacement means movable within the body so as to interrupt the

seal permitting fluid to pass along the passageway (4) between the ends, the first mating surface and the seal presenting a sterilisable surface, wherein the distance between the first and the second mating surfaces of the valve remains unchanged during movements of the seal displacement means within the body.

76. A valve as claimed in claim 75, in which the body comprises a hollow housing (5, 301, 410, 905, 906) extending between the first and the second open ends.

77. A valve as claimed in claim 76, in which the seal displacement means comprises a piston (9, 309, 420) slidably movable within the housing (5, 301, 410, 905, 906).

78. A valve as claimed in claim 75 comprising an operating means having an actuator (7, 117, 430) externally mounted on the body and movable between a first and a second end position, the actuator (7, 117, 430) being linked with the seal displacement means so that movement of the actuator (7, 117, 430) between the first and the second end positions causes the seal displacement means to translate along the passageway between open and closed positions.

79. A valve as claimed in claim 78, in which the actuator (7, 117, 430) is linked with the seal displacement means via a cam pair.

80. A valve as claimed in claim 75, in which at least one guide element (211, 311, 419) is provided in the valve to prevent rotational motion of the seal displacement means and to permit the seal displacement means to move only linearly in the passageway.

81. A valve as claimed in claim 75 including means for displaying to a user the actuation state of the valve.

82. A valve as claimed in claim 75, in which a seal is provided at both the first and the second open ends of the body, each seal having a seal displacement means movably disposed within the passageway of the body so that the first and/or second ends may be sealed or opened.

83. A valve (400, 900, 990) comprising a body having first and second open ends and a passageway (403) for fluid between the ends, the first end including a first coupling means (540) with a first mating surface and the second end including a second coupling means (540) with a second mating surface, the first and the second coupling means (540) being sealingly mateable with mating surfaces about openings (205) of a first and a second external devices (201), in which first and second seals are provided for removably blocking open areas of the first and the second ends, respectively, which in use are placeable in register with the openings (205) of the first and the second external devices (201), the valve (400, 900, 990) further including a pair of seal displacement means (420) movable within the body so as to interrupt at least one of the seals

permitting fluid to pass along the passageway (403) between the ends, the first mating surface and the first seal presenting a first sterilisable surface, and the second mating surface and the second seal presenting a second sterilisable surface.

84. A valve (400, 900, 990) as claimed in claim 83, in which the body comprises a hollow housing (410, 905, 906) extending between the first and the second open ends.

85. A valve (400, 900, 990) as claimed in claim 84, in which the seal displacement means comprises a piston (420) slidably movable within the housing (410, 905, 906).

86. A valve (400, 900, 990) as claimed in claim 83 comprising an operating means having at least one actuator (430) externally mounted on the body and movable between a first and a second end position, the actuator (430) being linked with at least one of the seal displacement means so that movement of the actuator (430) between the first and the second end positions causes the seal displacement means to translate along the passageway (403) between open and closed positions.

87. A valve (400, 900, 990) as claimed in claim 86, in which the actuator (430) is linked with the seal displacement means via a cam pair.

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88. A valve (400, 900, 990) as claimed in claim 83, in which at least one guide element (419) is provided in the valve to prevent rotational motion of the seal displacement means and to permit the seal displacement means to move only linearly in the passageway.

89. A valve as claimed in claim 83 including means for displaying to a user the actuation state of the valve.

90. A valve as claimed in claim 83, wherein the distance between the first and the second mating surfaces of the valve remains unchanged during movements of the seal displacement means within the body.